

**Amendments to the Claims:**

Please revise the claims as follows:

Claims 1-33 (withdrawn)

34. (currently amended) A process for densifying porous structures inside a furnace ~~using pressure gradient CVI/CVD~~, the process comprising:

- providing a furnace, the furnace defining an outer volume;
- assembling a multitude of porous structures and ring-like spacers in a stack with a ring-like spacer between each adjacent pair of porous structures;
- disposing the stack of porous structures between a bottom plate and a top plate in the furnace, wherein the bottom plate, the stack of porous structures, and the ring-like spacers define an enclosed cavity extending from the bottom plate, including each porous structure aperture, and terminating proximate the top plate;
- providing a channel for fluid communication between the enclosed cavity and the outer volume;
- allowing a gas to flow through the channel while maintaining a pressure gradient between the enclosed cavity and the outer volume; and
- densifying the porous structures using pressure gradient CVI/CVD.

35. (original) The process of claim 34 wherein at least one of the ring-like spacers comprises a plurality of channels, the plurality of channels providing fluid communication between the enclosed cavity and the outer volume.

36. (original) The process of claim 34 wherein the porous structures are densified from an average density of less than  $0.60 \text{ g/cm}^3$  to an average density of greater than  $1.70 \text{ g/cm}^3$  in a single cycle of pressure gradient CVI/CVD.

37. (original) The process of claim 36 wherein the porosity of the porous structures after densification is less than 15%.

38. (original) The process of claim 34 further comprising the step of regulating the pressure differential between the enclosed cavity and the outer volume so that it

does not exceed a predetermined value.

39. (original) The process of claim 34 further comprising the steps of  
providing a bottom pressure release between the enclosed cavity and the  
outer volume, and  
releasing gas through the bottom pressure release when a pressure  
differential between the enclosed cavity and the outer volume reaches a  
predetermined value.

40. (original) The process of claim 39 wherein the predetermined pressure  
differential value is between 10 and 40 torr.

41. (original) The process of claim 34 further comprising the step of placing a  
plurality of spacer blocks between the porous structures, wherein spacer blocks  
are placed near the outer diameter of a porous structure if an inner-diameter type  
spacer is used, and wherein spacer blocks are placed near the inner diameter of  
a porous structure if an outer-diameter type spacer is used.

42. (currently amended) A process for densifying porous structures inside a  
furnace ~~using pressure gradient CVI/CVD~~, the process comprising:  
providing a furnace, the furnace defining an outer volume;  
assembling a multitude of porous structures and ring-like spacers in a  
stack with a ring-like spacer between each adjacent pair of porous structures;  
disposing the stack of porous structures between a bottom plate and a top  
plate in the furnace, wherein the bottom plate, the stack of porous structures, and  
the ring-like spacers define an enclosed cavity extending from the bottom plate,  
including each porous structure aperture, and terminating proximate the top plate;  
introducing a reactant gas into the enclosed cavity;  
introducing a portion of the reactant gas into the outer volume while  
maintaining a pressure gradient between the enclosed cavity and the outer  
volume; and

densifying the porous structures using pressure gradient CVI/CVD.

43. (original) The process of claim 42 wherein a concentration of reactant gas in the enclosed cavity is greater than a concentration of reactant gas in the outer volume.

44. (original) The process of claim 42 wherein a channel provides fluid communication between the enclosed cavity and an outer volume defined by the interior surface of the furnace.

45. (original) The process of claim 42 wherein at least some of the ring-like spacers comprise a channel providing fluid communication between the enclosed cavity and the outer volume.

46. (original) The process of claim 42 wherein the porous structures are densified from an average density of less than  $0.60 \text{ g/ g/cm}^3$  to an average density of greater than  $1.70 \text{ g/ g/cm}^3$  in a single pressure gradient CVI/CVD cycle.

47. (new) The process of claim 34 wherein the pressure in the enclosed cavity is at least about 11 torr.

48. (new) The process of claim 34 wherein the pressure in the enclosed cavity is at least about 16 torr.

49. (new) The process of claim 34 wherein the pressure in the enclosed cavity is between about 11 torr and about 50 torr.

50. (new) The process of claim 34 further comprising introducing a reactant gas into the enclosed cavity at a first flow rate, wherein the gas flowing through the channel has a second flow rate less than 10% of the first flow rate.

51. (new) The process of claim 34 wherein the gas comprises between 5% and 20% reactant gases.

52. (new) The process of claim 34 wherein the pressure in the enclosed cavity is at least about 11 torr.

53. (new) The process of claim 34 wherein the pressure in the enclosed cavity is at least about 16 torr.

54. (new) The process of claim 34 wherein the pressure in the enclosed cavity is between about 11 torr and about 50 torr.